to the renal arteries. Large aneurysms were also present involving both common iliac arteries, both external iliac arteries and both hypogastric arteries. There was a small aneurysm of the left profunda femoris. The aneurysms were relatively thin-walled and quite easily compressible. After dissection and clamping were completed, 500 cc. of blood was withdrawn from the largest aneurysm. This blood was later returned to the patient. The aortic, common iliac, external iliac and common femoral aneurysms and arteries were resected as one specimen. The hypogastric arteries and both profundas were ligated. A teflon bifurcation prosthesis was used to reestablish continuity.

The pathologist reported "atherosclerotic arteries with fusiform and saccular aneurysms."

The patient made an uneventful recovery and left the hospital ambulatory on the fourteenth postoperative day. When last examined, in February, 1960, he was symptom-free. He was comfortable walking and had returned to work.

Department of Surgery, Loma Linda Hospital, Loma Linda (Miller).

Removal of Left Ventricular Aneurysm With the Heart Exposed and Circulation Maintained by Heart-Lung Machine

JEROME HAROLD KAY, M.D.,
ROBERT M. ANDERSON, M.D.,
SOL BERNSTEIN, M.D., and
PAULINO TOLENTINO, M.D., Los Angeles

In 1958 Bailey, Bolton, Nichols and Gilman[1] described the removal of left ventricular aneurysms following myocardial infarction. They advocated the closed technique method of excising aneurysms of this kind. The following case exemplifies the rapidity with which these aneurysms may enlarge, the symptoms of congestive failure, and surgery with the heart opened to expose the operative field.

The patient, a 47-year-old white man, was working under a trailer in Alaska on February 12, 1959, when he noticed the sudden onset of shortness of breath and severe pain in the chest, radiating to the elbows. Within 15 or 20 minutes he felt somewhat better and he rode in the truck for a distance of 35 miles. While riding, he gradually became worse, vomited, and perspired profusely. He was admitted to Providence Hospital in Anchorage, Alaska, where he remained for five weeks. He was informed there that an aneurysm of his heart had developed. In the first films taken in Alaska, this lesion was very small and hardly noticeable.

When the patient was first observed by the authors on June 17, 1959, there was no history of orthopnea, although he had noticed paroxysmal nocturnal dyspnea and shortness of breath on the least exertion. Upon physical examination the patient was observed to be well-developed and nourished. With the patient recumbent the blood pressure in the right arm was 100/50 mm. of mercury and in the right leg 170/130 mm. There were good carotid, brachial, ulnar, radial, femoral and posterior tibial pulsations bilaterally. The right radial pulse was stronger than the left. The dorsalis pedis pulse could not be felt on either side. The edge of the liver was not palpable. Upon cardiac auscultation a diffuse apical beat was heard at the left fifth intercostal space over an area of about six centimeters. No thrill was palpable. The pulmonic second sound was normal. No murmurs were heard.

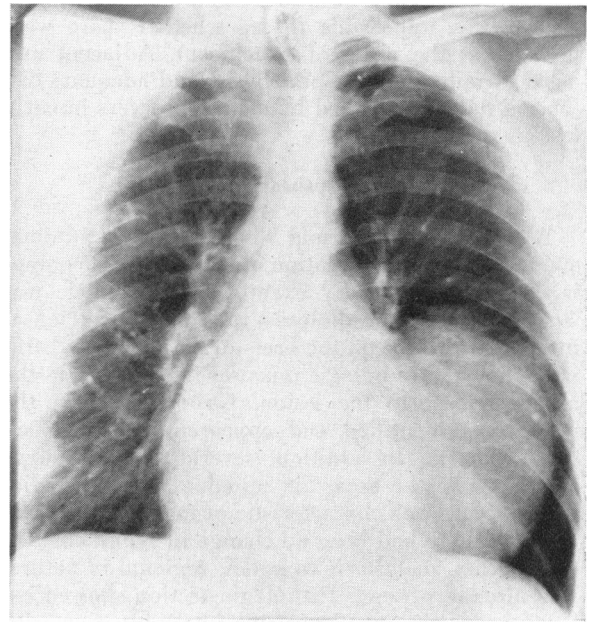

Figure 1.—Preoperative x-ray film showing large left ventricular aneurysm.

An x-ray film (Figure 1) taken June 20 showed an aneurysm involving the myocardium of the left heart border in the left ventricular region with some associated pleural thickening. This had increased to a pronounced degree since the small aneurysm was noted first on February 26, 1959.

An electrocardiogram on June 20, 1959, was interpreted as indicating extensive anterolateral myocardial infarction. The ST T wave changes suggested either a relatively recent process or a ventricular aneurysm. Because of the rapidity of the growth of this lesion, operation was done on the fourth day in the hospital and a left ventricular aneurysm was completely resected. Extracorporeal circulation through the heart-lung machine was maintained for 58 minutes, the heart being permitted to beat throughout. The aneurysm, about 12

Aided by a grant (No. H-3827-C1) from The United States Public Health Service.

From the Department of Surgery and Medicine of the University of Southern California School of Medicine and the Department of Surgery of Saint Vincent's Hospital, Los Angeles.

Submitted November 10, 1959.

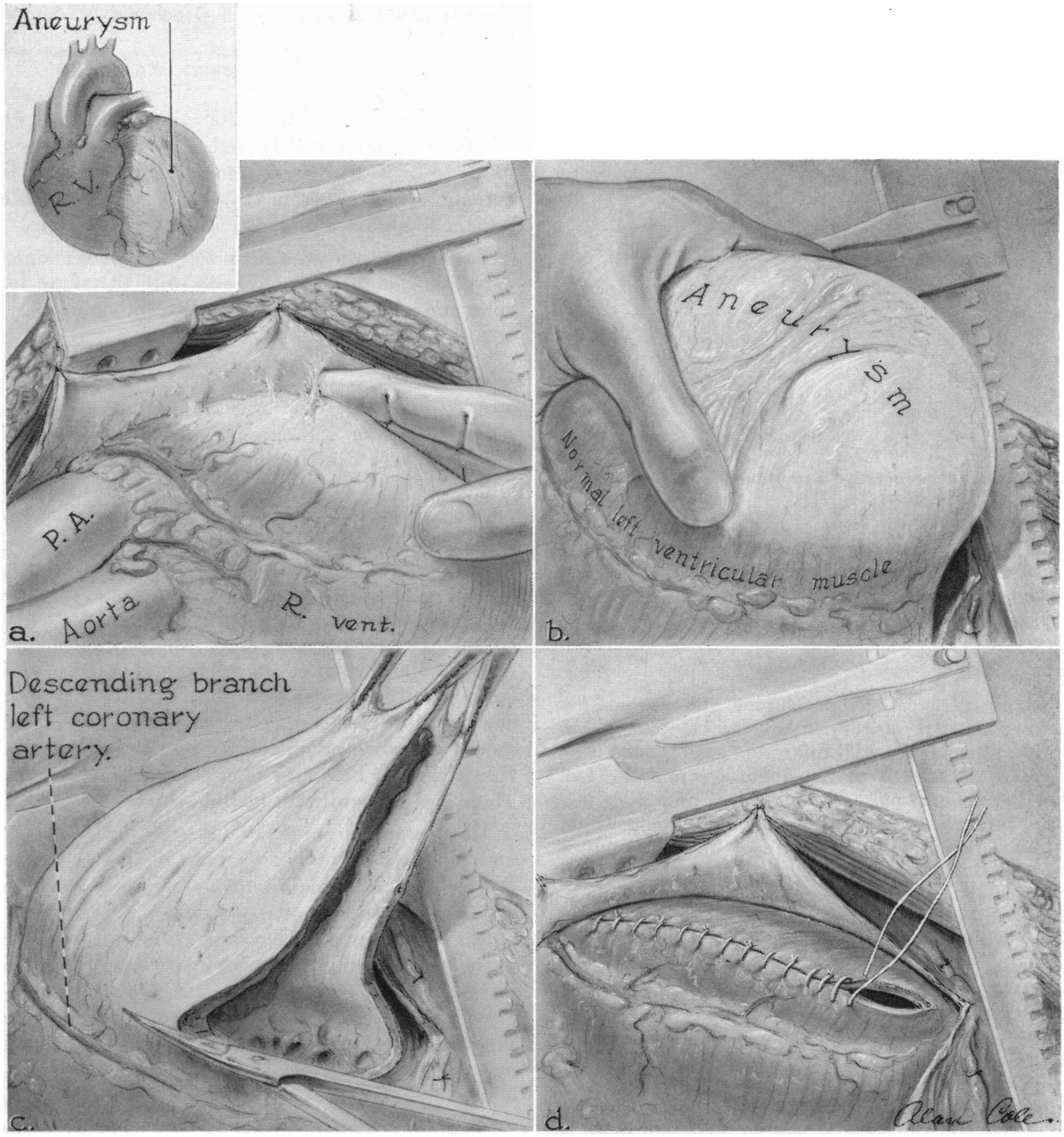

Figure 2.—Artist's conception of left ventricular aneurysm and its removal in present case.

cm. in diameter, extended within 1 centimeter of the circumflex artery and down to the apex of the heart. It also extended from within 2 centimeters of the descending branch of the left coronary artery over to the left. At its thinnest area the aneurysm was about 2 millimeters in diameter and at its base it was approximately 10 millimeters in diameter. The aneurysm was opened and many small clots were evacuated. These clots were thin and adherent to the wall of the aneurysm. The aneurysm was excised, leaving a 1 centimeter rim of good fibrous tissue around its base (Figure 2). The defect in the left ventricular muscle was closed in a longitudinal direction with multiple interrupted figure of eight sutures of No. 1 silk. Two continuous rows of No. 1 silk were then used to further support the suture line. The cardiopulmonary by-pass then was discontinued and the heart continued to beat well.

Postoperatively the patient did well. However, due to a great deal of pulmonary secretion, tracheotomy had to be done 48 hours after the resection of the aneurysm. The tube was kept in place for eight days to facilitate aspiration of the secretions. After it was removed, the patient continued to do well. X-ray examination (Figure 3) after the operation showed no evidence of the aneurysm. When last

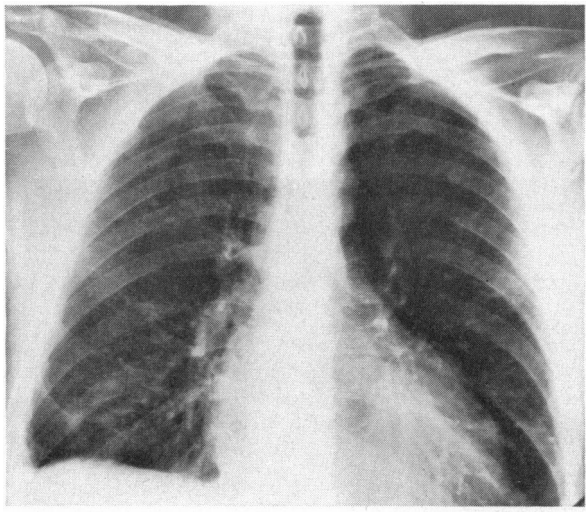

Figure 3.—Postoperative x-ray film showing normal appearance of the heart.

seen four months later the patient felt well. He volunteered that he was no longer short of breath, that he felt as well as he had before the attack in February, 1959, and was back at work.

DISCUSSION

A case of a rapidly developing and progressing left ventricular aneurysm during a four-month period after myocardial infarction is presented. The rapidity of growth of the aneurysm and the fact that the aneurysmal sac removed at operation was quite thin-walled, suggested that this patient would probably have died of rupture of the sac within a very short time. It is felt that all patients with left ventricular aneurysm following myocardial infarction should be operated upon if there is any evidence of heart failure or embolization. If neither of these findings is present, the patient should be observed closely with serial x-ray examination at least every three months, and if there is enlargement of the aneurysm, operation should be performed.

Excision of ventricular aneurysms with use of the heart-lung machine is believed to be better and safer than the closed technique. With the heart open, a more definitive procedure can be done and there is not the danger of embolization from the clot within the sac that there is with closed heart operations.

At last report the patient had returned to work.* He felt essentially the same as he did before the myocardial infarct. On physical examination a Grade II systolic murmur was heard to the left of the sternum at the third and fourth intercostal spaces.

2122 West Third Street, Los Angeles 57 (Kay).

REFERENCE

1. Bailey, C. P., Bolton, H. E., Nichols, H., and Gilman, R. A.: Ventriculoplasty for cardiac aneurysm, J. Thor. Surg., 35:37-67, Jan. 1958.

*May 23. The patient continues to work and do well.

Spontaneous Remission of Diabetes

R. B. HAINING, *M.D.*, Glendale, and
R. G. HAINING, *M.D.*, Boston

PERSONS who recover from diabetic acidosis usually need insulin or dietary restriction or both for the rest of their lives. Sustained remission or recovery is extremely rare either in children or adults. "Once a diabetic always a diabetic" is almost axiomatic.

The woman whose history follows has remained aglycosuric and normoglycemic, without taking insulin and with no restriction in diet, for six years.

REPORT OF A CASE

A 62-year-old widow was admitted to the Glendale Sanitarium and Hospital on the evening of February 11, 1954. Her husband had died suddenly late in 1953. On January 10, 1954, the patient became ill with what she thought was influenza. Her principal complaints were low-grade fever, malaise, insomnia and poor appetite. On February 1, 1954, she was given Aureomycin capsules. On February 7 she noticed that her mouth felt dry "like cotton." Her tongue was coated, and she was mildly nauseated and vomited once. She had several brief episodes of epigastric-retrosternal distress which she described as "angina." She stated that in the month preceding admission she had lost 16 pounds. Her weight on February 11, 1954, was 110 pounds. There was no significant family history.

The temperature was 99° F., the pulse rate 80 and blood pressure 170/90 mm. of mercury. The lips were dry and cracked, the tongue coated and the superficial vessels in the pharynx moderately engorged. There was no physical evidence of disease of the heart or lungs, although an electrocardiogram was interpreted as showing "lateral myocardial ischemia and left ventricular hypertrophy." The optic fundi appeared normal for a person of the stated age. There were no abnormal abdominal or neurological findings.

On routine urinalysis there was a 4 plus reaction for sugar and 2 plus for acetone. The hemoglobin was 11.4 grams per 100 cc. of blood, and leukocytes numbered 11,300 per cu. mm., 83 per cent neutrophils. Fasting blood sugar on February 12, 1954, was 610 mg. per 100 cc. The carbon dioxide combining power was 41 volumes per 100 cc. Nonprotein nitrogen was 30 mg. per 100 cc. of blood. The serum acetone reaction was 2 plus.

During the next four hours 225 units of crystalline insulin and two liters of 0.85 per cent sodium chloride were administered intravenously. After four hours the blood sugar was 62 mg. per 100 cc.

Submitted March 3, 1960.